Research Note

NORTHERN ROCKY MOUNTAIN
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SEEDING CRESTED WHEATGRASS ON CHEATGRASS LAND

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A cheap, practical method for converting cheatgrass infested old fields to permanently productive range land is being demonstrated in the Bitterroot Valley of western Montana by experimental plantings of the Northern Rocky Mountain Forest and Range Experiment Station and by large-scale field plantings made by Stanley Antrim, a well known Bitterroot stockman.

Crop to Offset Plowing Cost

The method known as the "preparatory crop method" involves a season's cropping of the cheatgrass land as a step in preparing a seedbed for crested wheatgrass or other perennial forage plants. Experience has shown that a good thorough plowing which turns the cheatgrass well under is about the only practical type of cultivation for destroying cheatgrass sufficiently to give perennial grasses a fair chance to become established. Although plowing, harrowing, packing, and drilling directly to crested wheatgrass at a rate of 8-10 pounds usually costs from $5 to $7 per acre, ranchers who have tried it feel that it is worthwhile in the long run. On the other hand, some feel that it is difficult to justify such costs for establishing crested wheatgrass on cheatgrass land and are awaiting development of a cheaper method. Therefore the main objective of the preparatory crop is to provide a prompt return in the form of a forage or grain crop to help offset the costs of plowing and seeding. Cropping with the small grains also gives the soil a chance to settle and leaves a stubble to help hold moisture and prevent blowing. In fact, clean stubble is a splendid seedbed for drilling crested wheatgrass. Remember this point whenever retiring land from cultivation and reseed it promptly before it is taken over by weeds and cheatgrass.

Rye Stubble Makes Good Seedbed

The Experiment Station started work with the preparatory crop method in the spring of 1943 on an experimental range reseeding area which is located in a corner of Stanley Antrim's lambing range on the dry cheatgrass covered benchland east of Florence, Montana. On April 15, a small area was plowed and harrowed. Part of it was drilled directly to crested wheatgrass and another part to spring rye. Both the crested wheatgrass and the rye did very well. It cost about $6 per acre, however, to obtain this stand of crested wheatgrass

and it will be a few years before increased returns will offset this cost. The rye was cut for hay and produced somewhat more than a ton per acre. A local feed dealer estimated that rye hay was worth at least $6 per ton the winter of 1943-44. Though none of the rye was left for grain, it was estimated that it should have yielded around 15 bushels per acre. Crested wheatgrass and several other promising perennial forage species was drilled into the rye stubble without other soil preparation in October 1943. Good stands of most of these resulted. Though there was some cheatgrass growing among the reseeded plants in 1944, it was so thin that it did not seriously affect their development. The value of the hay crop produced was far more than enough to pay the cost of seeding and harvesting the hay and therefore made a considerable contribution toward meeting the entire costs connected with the reseeding operation.

Other Crops Give Good Returns

Initial tests with the preparatory crop method were so encouraging that it was decided to test other variations of the method to see how much leeway a rancher might have -- as to time of plowing, seeding, kind of crop, and method of harvest -- without sacrificing cheatgrass control or returns from the preparatory crop. Consequently, 1½ acres of cheatgrass land were plowed and seeded to fall rye in late October 1943. Another patch of 3/4 acre was plowed in late November and left rough during the winter. About the middle of April 1944 another acre was plowed. The late fall and spring plowed patches were then harrowed down and drilled to several cereal crops and crested wheatgrass, each in separate plots as follows: Compana and Horsford varieties of barley and victory oats on the fall plowing and the two barleys, spring and fall rye, and crested wheatgrass on the spring plowed ground. One-half of each of the cereal crops was mowed for hay and the other half of each allowed to mature before being cut for grain. In the case of the rye seeded in the fall, one-third of the area was fenced and grazed by sheep starting about May 13, another one-third was mowed for hay and the remainder was cut for grain. The yields of all these crops, except the spring seeded fall rye, were satisfactory either as hay or grain as shown in table 1.

Table 1.--Yields per acre of several preparatory crops grown and harvested in various ways on typical cheatgrass land in the Bitterroot Valley in 1944.

Crop	Time of preparation & seeding	Hay per acre	Grain per acre
		pounds	bushels
Fall rye	Fall seeded on fall plowing	2,290	23.0
Spring rye	Spring seeded on spring plowing	1,600	17.5
Fall rye	Spring seeded on spring plowing	800	not sampled
Compana barley	Spring seeded on fall plowing	1,840	44.5
Horsford barley	Spring seeded on fall plowing	1,240	43.0
Victory oats	Spring seeded on fall plowing	1,880	stripped by grasshoppers
Compana barley	Spring seeded on spring plowing	2,040	34.5
Horsford barley	Spring seeded on spring plowing	1,200	31.5

The spring seeded fall rye made a fine growth of basal leaves and would have provided good early summer grazing. However, only a few seedstalks were produced and very little forage was high enough to mow. Harvest of the oat grain was prevented by a sudden moving in of grasshoppers from the surrounding area of dry cheatgrass.

Harvest Method Affects Cheatgrass Control

No provision was made for determining the amount of forage obtained by the sheep from the grazed portion of the fall seeded rye. It was apparent, however, that the cheatgrass was much more thrifty among the rye that was grazed than among that which was allowed to continue growth and was later cut for hay or grain. The cheatgrass on the plowed and grazed area stayed green a couple of weeks longer than on the surrounding undisturbed areas and the grasshoppers moved in and stripped the heads before seed was formed. In this way the cheatgrass which threatened to seed back the grazed area was prevented from doing so. Since grasshoppers cannot always be depended upon to do this sort of thing, it seems likely that cheatgrass control will usually be less satisfactory when the cereal crop is grazed than when it is cut for hay or grain. By the same logic, it would appear that moving for hay, which removed the cheatgrass close to the ground often before seed maturity, should give somewhat better control than leaving the crop for grain. The problem of competition from volunteer grain is also likely to be less when the crop is mowed for hay. When the stubble areas were examined on November 25, there were only occasional cheatgrass plants to be found on any of the areas. The reseeded species were then beginning to appear and satisfactory stands are expected.

Preparatory Crop Pays

After harvesting crops ranging from 800 to 2,290 pounds of hay and from 17.5 to 44.5 bushels of grain per acre from the 1944 preparatory crop areas (see table 1), crested wheatgrass and several other promising perennial forage species were drilled on October 10, 1944 directly into the stubbles without any other soil treatment or preparation. Returns from most of the preparatory crops were large enough to pay most, if not all, of the entire costs connected with soil preparation and seeding. Thus the stands of grass obtained in this way will be starting out with a clean slate and any increase in forage production over that formerly produced by cheatgrass will be pure profit. In the case of the crested wheatgrass seeded directly on plowed ground, the first few years of "profit" must go to pay the seeding costs.

Large-Scale Tests Also Good

The good results obtained on the experimental area are also borne out by Mr. Antrin's successes with the method on large-scale plantings both in 1943 and 1944. In the late spring of 1943, he had about 160 acres of cheatgrass land plowed and seeded to spring wheat which yielded about 15 bushel per acre. He drilled crested wheatgrass into the stubble in September 1943 and a fine stand has resulted over most of the field. The importance of careful plowing is well demonstrated here, as in the corners of the field where plowing was poorly done the stand of cheatgrass is thick and crested wheatgrass thin.

In the spring of 1944, Mr. Antrim plowed a 50-acre field of cheatgrass and seeded it to barley which yielded 20-25 bushel per acre. This stubble was very clean this fall when he drilled it to crested wheatgrass and prospects are good for a completely successful stand.

1943 and 1944 Seasons Above Average

In considering the returns from preparatory crops, as given here for 1943 and 1944, it must be remembered that in both of these years spring and early summer moisture was above average, and that the yields obtained were doubtless better than can be expected as a general rule on dryland in Montana. It is also probable that the good yields may be partly due to increased soil fertility built up through addition of organic matter by weeds and cheatgrass since cultivation was abandoned, and that crop yields might again be expected to decline with continued cropping. Preparatory crops on dryland should always be seeded with the idea of cutting for hay except in unusually favorable seasons when chances for a grain crop may be good. It should also be remembered that even though in dry years the crops may not yield enough to pay all costs connected with converting cheatgrass range to crested wheatgrass, even a light crop of cereal hay will help to meet these costs and may go a long way toward solving the winter feed problems that follow a dry year. Remember also that the end result -- a good crested wheatgrass range -- is just about the most dependable and economical source of range feed, good years and bad, that is yet known for Montana.

Try It In 1945

Spring plowing should be done early in order that the preparatory crops may be seeded at the earliest date considered safe for the crop in a particular locality. Cheatgrass germinated rather well in the late fall of 1944 and good kills should result, provided spring plowing is done well. Use of the preparatory crop method in 1945, while there is still an urgent need for all the hay or grain that can be produced, should make it possible for landowners to replace cheatgrass with crested wheatgrass at a minimum of cost. In this way, they can make a permanent improvement in their land and put themselves in better shape to meet postwar adjustment problems at the same time that they are helping to meet wartime demands for maximum production.

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Note: This is a copy of Friedrich's article as it appeared in the March 1, 1945 issue of the Montana Farmer.